IDAHO
SCHOOL BUS
SPECIFICATIONS

Type C – Conventional School Bus

August, 2004

Idaho Department of Education
Bureau of Finance and Transportation
Pupil Transportation Section

IDAHO TYPE – C
SCHOOL BUS SPECIFICATIONS
SPECIAL INSTRUCTIONS

INDEFINITE QUANTITY CONTRACT FOR SCHOOL BUSES – Contract award will be for a ONE (1) year period of time commencing September 1, 2004, or date of award, and expiring August 31, 2005.

QUANTITITES – Quantities given are estimates of use for bidding purposes only and are not guarantees. The actual number of buses to be ordered and their delivery locations are unknown. No minimum order quantities are guaranteed.

Contract is for use by State of Idaho Public School Districts and Charter Schools and also by any other Public Agency entitled to do so through use of the Public Agency Clause (Idaho Code).

INDEFINITE QUANTITY BIDS – Sealed bids will be taken on Type – C school buses that are completely assembled, delivered, and serviced according to the specifications contained herein.

CONSTRUCTION – It is the intent of these specifications to describe a Type – C school bus that shall be basically of all steel construction or of some other material which has at least equivalent strength of all steel construction as certified by the bidder. All parts not specifically mentioned, which are necessary in order to provide a complete bus shall be furnished by the successful bidder and shall conform in strength, quality of material and workmanship to which is usually provided by the engineering practice indicated in these specifications. The completed school bus shall meet all Federal Motor Vehicle Safety Standards (FMVSS) and requirements of the State of Idaho (latest revision of *Standards for Idaho School Buses and* Operations - SISBO). Dealer modification may be required and must be of OEM quality where OEM equipment will not meet specifications.

All parts not specifically mentioned, but necessary to provide a complete school bus, shall be furnished by the contractor and shall conform in strength, quality of materials and workmanship to those provided by engineering practices indicated in these specifications.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

PERFORMANCE OF BIDDER – Bidders shall indicate (in detail form) their proposal to meet the following criteria. 1) Ability to render prompt service including production capabilities; 2) Statement including engineering facilities and experience in manufacturing school buses; 3) Ability to manufacture school buses in strict conformity

with these specifications and service requirements. Note: Failure to submit this information may subject your bid to rejection.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

DELIVERY – It will be the responsibility of the dealer to insure the Idaho New Bus Inspection is completed (33-1506, Idaho Code) and to deliver the complete unit to the district purchasing the bus. Contractor will be required to assume complete responsibility of the delivery of buses to the district and shall save the State and district harmless against fire, public liability and property damage.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

SERVICE OUTLETS – Bidders must indicate the extent of their ability to render prompt service by furnishing a list of branch offices and authorized service agencies. These offices/agencies must maintain a complete stock of repair parts that may be secured by ordering by number and at such discount as may be quoted from time to time by the manufacturer of the school bus purchased under these specifications. It is the responsibility of the bidder to complete all recalls at their branch agencies or by their personnel on site at district facilities, and in a prompt and timely manner.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

DOCUMENTS AND PUBLICATIONS – Bidders are required to furnish with their bids basic specifications, chassis/body layout drawings and a sample warranty. A list of all Special Equipment (including parts numbers, color code, etc.) used on the chassis/body must be furnished. Successful bidders shall furnish the following items for each chassis/body that is purchased:

1. Idaho Application for Certificate of Title.
2. Operator's manual.
3. Warranty certificate.
4. One (1) Parts and Service/Repair Manual for body/chassis in hard-copy form, on CD-ROM, or a downloadable PDF file containing the required information. All

vehicle information furnished must pertain to the specific model being purchased. If furnished, these files and CD's must contain an index with page numbers. Note: Must be able to load CD-ROM on computer hard drive.

5. Manufacturer's Statement of Origin.
6. One build sheet (line-setting ticket) including all parts information relating to the chassis/body, to include all engine information (S/N) and transmission information (S/N).

NOTE: Service policies, line setting tickets, parts and service/repair manuals and warranty cards shall be available during the Idaho New Bus Inspection.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

CERTIFICATION – Chassis and Body manufacturer's, upon request of the Idaho State Department of Education Pupil Transportation Section, shall certify that its product meets all Idaho minimum construction standards delineated in the latest revision of *Standards for Idaho School Buses and Operations* (SISBO) for items not covered by the FMVSS certification requirements of 49 CFR, Part 567.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

WARRANTY – Bidder shall warrant for five (5) years/unlimited miles the entire power train (engine, transmission, differential, driveshaft and its bearings, engine electronic controls), water pump, alternator, starter, turbocharger, and all interior and exterior paint. Bidder shall warrant all other chassis items for the manufacturer's standard warranty period. Bidder shall warrant the body and all related items, for the manufacturer's standard warranty period or two (2) years, whichever is greater.

All warranty periods are to commence on date the respective vehicle is placed in service by the District. All parts and labor shall be the responsibility of the bidder. Correction of latent defects, undiscovered during the initial acceptance inspection by the State but appearing before the applicable warranty period has elapsed, will be the full responsibility of the bidder, at no cost to the State of Idaho or school district. Upon award, bidder will provide the district with original copies of warranties offered in accordance with the above requirements on all chassis and body items, except for those items covered above by the 5-year warranty. By execution of bid, bidder agrees to the 5-year warranty requirement in its entirety as specified above.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

COMPONENTS – Bidders shall guarantee that chassis offered are current models, that assembly parts are in production for use in new chassis/body and that their manufacture and sale through dealer source will not be discontinued within ten years.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

INSPECTION – State inspection and acceptance will be at a location prearranged with the Department of Education, Pupil Transportation Section. School Buses that do not comply with the grade of workmanship or type of materials in conformity with specifications will not be accepted.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

WEATHER PROTECTION – All dash instruments, horn button, ignition switch, etc., of the chassis shall be adequately protected against weather while chassis are in storage.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

SERVICE – The complete bus shall be inspected and completely serviced by the dealer before being placed in-service by the District. This service shall include:

1. Complete lubrication of chassis.

2. Filling of steering, engine, cooling system, transmission, and rear axle to proper fluid capacities.

3. Adjustment of engine and all other mechanical features to assure perfect operation.

4. Inspect, adjust, correct, and replace any parts not in proper operating condition or not in compliance with specifications.

5. Fill fuel tank with diesel fuel to at least ¼ capacity.

6. Check bus for proper turning radius and wheel alignment.

Exceptions taken to these service requirements may be considered just cause to reject the bid from consideration.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

MINIMUM REQUIREMENTS OF A TYPE-C SCHOOL BUS CHASSIS

APPROVED LOW EMISSION ELECTRONIC DIESEL ENGINES

MAKE	MODEL	HORSEPOWER	TORQUE	EPA STANDARD
Caterpillar	C-7	210	520	2004
IC	VT 365	215	540	2004
Mercedes	MBE900	210	520	2004

Approved Chassis Requirements

Basic Pupil Load	**41**	**53**	**66**	**72**	**78**
Manufacturers GVWR	19,000	24,000	24,000	24,000	24,000
Wheel Base (approximate)	165”-193”	214”-218”	252”-255”	274”-277”	273”-278”
Frt. Axle Cap. (lbs.)	10,000	10,000	10,000	10,000	10,000
Rear.Axle Cap. (lbs.)	15,000	19,000	19,000	19,000	19,000
Frt. Spring Cap @ Ground	5,000	5,000	5,000	5,000	5,000
Trans. Speeds Forward	5	5	5	5	5

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

DETAIL REQUIREMENTS – TYPE C
CONVENTIONAL SCHOOL BUS CHASSIS

AIR CLEANER – Chassis to be equipped with a dry, element-type air cleaner. The air cleaner and the element shall meet all appropriate SAE J726 tests, per engine application. All air cleaner assemblies shall be single-stage and equipped with a locking restriction gauge.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

AXLES

Front Axle – The front axle shall have gross weight capacity at the ground according to the chassis manufacturer's rating, equal to or exceeding that portion of the total load which is supported by the front axle. (See table above for axle capacities). Include cast iron hub assemblies with unitized oil bath seals and 50W synthetic lube.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Rear Axle – The rear axle shall be of full-floating type and have a gross weight capacity at ground according to the chassis manufacturer's rating equal to or exceeding that portion of the total load which is supported by the rear axle. Axle shall be equipped with a magnetic fill plug, magnetic drain plug and filled to recommended level with 75W-90 synthetic lubricant. Rear Axle Ratio shall be designed to achieve maximum fuel economy using the following criteria. 1) A sustained pull on a 6% grade with speed not dropping below 28 mph on school buses with speed control set @ 45 mph.

NOTE: AT ANY TIME DURING THE FIVE (5) YEAR WARRANTY PERIOD THAT A REAR AXLE IS DETERMINED TO BE THE CAUSE OF NOISE (SOUND PRESSURE RADIATED TO THE INTERIOR OF A SCHOOL BUS) THE CHASSIS MANUFACTURER SHALL BE RESPONSIBLE FOR MAKING REPAIRS. THIS IS TO BE MEASURED AT A REFERENCE POINT OF ONE-INCH (1") FROM THE EAR OF ANY SEATED PERSON. IF THAT LEVEL EXCEEDS 85 DECIBELS, THE

CHASSIS MANUFACTURER SHALL MAKE REPAIRS TO REDUCE THE NOISE LEVEL OF THE REAR AXLE TO ACCEPTABLE LIMITS.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

BATTERY – Battery is to be sealed maintenance free. Battery shall have minimum cold cranking capacity rating of 1200 cold cranking. Battery cables shall be long enough to allow full extension of battery tray. Battery cables to be at least one gauge, color-coded red-positive / black-ground and easily identified positive and negative. Battery ground cable shall be of the round covered type. Battery must be grounded to the rear of the engine or frame. If grounded to frame, frame must be grounded to engine with same size cable.

NOTE: ANY WIRES PASSING THROUGH THE FRAME RAILS SHALL BE GROMMETED TO PREVENT CHAFING.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

BRAKES – The chassis shall be equipped with four wheel brakes. Requirements. *Drums to be equipped with stamped dust shields and must be able to check brake lining condition without removing shield.* All brake drums to be outboard mounted to facilitate brake maintenance without disturbing wheel bearings and seals. All brake lining is to be premium grade asbestos free material of FF friction rating and identified *as to the* co-efficient of friction by bidder.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Air Brakes – Air brakes shall have S-cam type actuation and meet FMVSS 121. Brakes to have cast iron spider. Air reservoirs shall be mounted with the top of tanks approximately one (1) inch below the top of frame rail. Air tanks are to be equipped with automatic moisture ejector with cord of sufficient length to attach to body exterior. Air compressor is to be at least 13.2 CFM with five-ring piston (2 oil and 3 compression), air compressor and air intake is to be routed through engine air cleaner. Chassis to be

equipped with an air dryer. Automatic slack adjusters to be supplied on all air brake chassis.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Approved Brake Sizes – All chassis shall be equipped with air brakes. Stamped dust shields required for front and rear brake drums. Must be able to check brake lining condition without removing the shield.

Brake Size – All Chassis

Air – Front Outboard Drum	15.0 X 4.0 Inches
Air – Rear Outboard Drum	16.5 X 7.0 Inches

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Anti-Lock Braking System (ABS) – Front and rear wheel speeds are to be sensed separately. Application of front brakes is to be controlled by application pressure modulator and governed by the wheel approaching lock-up to minimize steering input. Rear brake application pressure modulation is governed by individual wheel speeds to minimize braking effort. System must be activated by the ignition switch and actuated by brake application. System shall include blink code diagnostic capability.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Parking Brakes – Parking brake system shall be designed and constructed to meet the following requirements:

1. Parking brake shall hold vehicle stationary or to limit of traction of braked wheels on 20 percent grade under any condition of legal loading when on surface free from snow, ice and loose material.

2. When applied, parking brake shall remain in applied position with capability set forth above, despite exhaustion of source of energy used for application or despite leakage of any kind.

3. Buses with air brakes shall have parking brakes of the spring applied and air release type. Control shall be of the pull to apply and push to release type and mounted in manufacturers standard location. This control shall be clearly marked yellow.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

BUMPER – The front bumper shall be of pressed steel channel or equivalent material at least 3/16" thick and not less than 8" wide (high). It shall extend beyond forward-most part of the body, grille, hood, and fenders and shall extend to outer edges of the fenders at the bumper's top line. Except for breakaway bumper ends, it shall be of sufficient strength to permit pushing a vehicle of equal gross vehicle weight without permanent distortion to the bumper, chassis or body.

The bumper shall be designed or reinforced so that it will not deform when the bus is lifted by a chain that is passed under the bumper (or through the bumper if holes are provided for this purpose) and attached to the towing device(s). For the purpose of meeting this specification, the bus shall be empty and positioned on a level, hard surface and the towing device(s) shall share the load equally.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

DRIVELINE – The torque capacity of the driveline assembly shall be equal to the maximum engine torque as developed through the lowest transmission gear reduction. All bearings shall be greasable and have an inner race so that failure of bearing shall not damage drive shaft. Each propeller shaft shall be equipped with a protective metal guard to prevent whipping through floor or dropping to ground if broken. Guard to be 7/16-inch round u-bolt or 1 1/4 x 3/8 inch flat bar.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

ENGINE – Diesel engines will be used in all size chassis. Acceptable engines are listed on Minimum Requirements page. Electrical system shall be of the single voltage type.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

EXHAUST SYSTEM – A total exhaust system, exhaust pipe, muffler and tail pipe shall be furnished by the chassis manufacturer, pre-engineered to terminate no less than 1 inch past a school bus body rear bumper location or at the left side of the bus body no more than 18 inches forward of the front edge of the rear wheel house opening. If designed to exit at the rear of the bus, the tailpipe shall extend at least five inches beyond the end of the chassis frame. If designed to exit to the side of the bus, the tailpipe shall extend at least 48.5 inches (51.5 inches if the body is to be 102 inches wide) outboard from the chassis centerline. Tail pipe shall be deflected downward at the end of the exhaust pipe. Tail pipe should be minimum 16-gauge aluminized steel/stainless steel and shall not be reduced in size after it leaves muffler. The chassis manufacturer shall provide sufficient tail pipe length to allow mounting by the Body Company without extension. ***At any point where the exhaust system is 12" or less from the fuel tank, the fuel tank shall be properly insulated with metal shield.***

Muffler shall be constructed of stainless steel or aluminized materials that meet federal emission guidelines. Exhaust pipe, muffler and tail pipe shall be of the heavy-duty type and of sufficient size to minimize backpressure.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

FENDERS AND HOOD – The total spread of outer edges of front fenders, measured at fender line, shall exceed total spread of front tires when front wheels are in straight-ahead position. The fenders shall be properly braced and free from any body attachment.

Chassis sheet metal shall not extend beyond rear face of cowl. Hood and fenders to be assembled as one unit and of the forward tilt type.

Under the tilt hood, there shall be installed in a convenient accessible location, a waterproof electrical disconnect plug(s) (quick disconnect of all electrical wiring to tilt hood) for all electric lines running to electric accessories mounted on the hood.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

FRAME – Each frame side member shall be of one-piece construction (minimum 36,000 psi). Routing of all brake lines and/or electrical wiring shall be located within the frame rail flanges. Convoluted tubing as to protect lines from chafing and wear shall protect openings in cross members for such routing.

Frames shall not be modified for the purpose of extending the wheelbase. Holes in top or bottom flanges or side units of the frame, and welding to the frame, shall not be permitted except as provided or accepted by chassis manufacturer. Frame lengths shall be established in accordance with the design criteria for the complete vehicle.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

FUEL TANK – The fuel tank shall conform to FMVSS 301 in construction and mounting. Fuel system to have an approved fuel filter and water separator between fuel tank and engine mounted in an accessible location for service. Tank to be equipped with a minimum of two internal baffles. Tank capacity shall be at least 60 gallons with aluminized interior. Tank shall be equipped for at least a 93-95% draw and shall be filled and vented to the outside of the body. Fuel tank may be mounted between the chassis frame rails or outboard of the frame rails on either the left or right side of the vehicle.

Fuel lines shall be mounted to the chassis frame in such a manner that the frame provides the maximum possible protection from damage.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

ALTERNATOR – Bus shall be equipped with a heavy-duty truck or bus-type alternator meeting SAE J 180, having a minimum output rating of 160 amperes or higher, and shall produce a minimum current output of 50 percent of the rating at engine idle speed.

The belt alternator drive shall be capable of handling the rated capacity of the alternator with no detrimental effect on any other driven components. (See SBMTC; “School Bus Technical Reference,” for estimating required alternator capacity.)

Serpentine belts shall be furnished to drive alternator and fan. Cowl and frame shall be grounded to engine by use of suitable grounding straps.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

WIRING – All conductors from the alternator to the battery shall be continuous in length and capable of carrying 200 amps. The conductors shall be sized to provide at least a 25 percent greater current carrying capacity than the design output of the alternator. The conductor between the alternator and the battery shall be routed in a manner that will provide the least distance between points of termination. A separate ground conductor from alternator to engine shall be provided. All wiring shall meet Society of Automotive Engineering (SAE) Codes.

All wiring shall use color and at least one other method of identification. The other method shall be either a number code or name code, and each chassis shall be delivered with a wiring diagram that illustrates the wiring of the chassis.

The chassis manufacturer shall install a readily accessible terminal strip, plug, connector or Field Effect Transistors (FETs), on the body side of the cowl unless not required due to vehicle being equipped with multi-plex wiring system. The strip or plug shall contain the following terminals for the body connections:

1. Main 100 amp body circuit
2. Tail Lamps
3. Right turn signal
4. Left turn signal
5. Stop lamps
6. Backup lamps
7. Instrument panel lights (rheostat controlled by head lamp switch)

An appropriate identifying diagram (color plus a name or number code) for all chassis electrical circuits shall be provided to the body manufacturer for distribution to the end user.

The headlight system must be wired separately from the body-controlled solenoid, unless not required due to vehicle being equipped with multi-plex wiring system.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

ROAD SPEED CONTROL – The electronically controlled engine is to be programmed to establish the maximum road speed of 70 mph.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

HORNS – The chassis shall be equipped with dual horns of manufacturer's standard make with each horn capable of producing a complex sound in bands of audio frequencies between 250 and 2,000 cycles per second and mounted so as not to collect water inside the horn. Horns must meet SAE J-377 testing.

LIGHTS – Each chassis shall be equipped with a minimum of two headlights and two turn signal lights. Turn signal shall be wired to operate as hazard warning lights and shall be connected to a variable load flasher or Electronic System Controller (ESC). If two flashers are used, both shall be of the heavy-duty variable load type. All lights shall be of the proper intensity and adjustment to meet the standards of the National Bureau of Standards. The headlight switch shall be of ample capacity to handle the load added by the addition of the clearance, marker, and strobe lights required on the body. There shall be provided on the inside firewall of the chassis terminals for the connection of the body tail lights, stop lights, backup light and license well light. Turn signal lights shall be wired to operate through the ignition switch.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

DAYTIME RUNNING LIGHTS – Low beam headlights, tail lights, parking lights, and marker lights shall operate at full voltage with the ignition switch on and the headlight switch off. The lights shall not engage while the starter motor is engaged.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

INSTRUMENT PANEL – The instrument panel shall be equipped with an ammeter or voltmeter, oil pressure gauge, water temperature gauge, million mile odometer, air pressure gauges, fuel gauge, and a high water temperature and low oil pressure light and buzzer which work independently of one another. Light indicators do not meet these requirements. An upper beam headlight indicator and directional turn signal indicators shall be provided. A glow-plug indicator light shall be provided when appropriate. All instruments and gauges should be located within 12 inches to the right or left of steering column. The instrument panel shall have lights of sufficient candlepower to illuminate all instruments.

All gauges shall be easily accessible for maintenance and repair.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

LUBRICATION SYSTEM – Chassis lubricating system shall be of the high-pressure type, with hydraulic type fittings located in accordance with best commercial practice. The fittings shall be designed to permit quick attachment of grease gun.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

OIL FILTER – The oil filter shall be of the manufacturer's standard full flow type with a dry capacity of at least one (1) quart.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

OPENINGS – All openings in floorboard or firewall between chassis and passenger carrying compartment, such as engine area and/or gearshift selector, shall be sealed.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

PAINT – All paint shall be unleaded. The hood, fenders and cowl shall be painted with National School Bus Yellow polyurethane or an approved acceptable equal paint. Bumper, frame, driveline and axle hubs shall be painted with jet-black enamel. Wheels (rims) shall be gray or black.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

RADIATOR/COOLANT – The radiator shall be of heavy-duty construction with welded headers. The radiator core shall be a welded tube to header joint for increased life. Radiator core shall not be soldered, and shall incorporate an expansion and de-aeration tank with overflow vent hose to route coolant away from the engine. The radiator shall be of sufficient size to adequately cool the engine and transmission under all operating conditions and shall have a valve for drainage. The cooling fan, mechanically belt driven, shall be equipped with a thermostatically controlled air clutch or viscous type to facilitate ease of operation and maintenance and meet or exceed OEM requirements. Coolant is to be of the Fully Formulated, Non-Organic, heavy-duty type and shall protect cooling system to –34 degrees Fahrenheit.

NOTE: The chassis/body supplier shall fill the cooling system with Fully Formulated, Non-Organic, heavy-duty coolant having a mix of (50%) water and (50%) coolant. Coolant type and additives shall meet all requirements of the respective engine manufacturer and radiator supplier.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

HOSE AND HOSE CLAMPS – All hoses shall be premium grade rubber construction or equivalent and all engine coolant hoses that require clamp connections of one inch diameter and larger on the engine or associated components shall be equipped with ***constant tension clamps***. (Breeze Clamps)

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

SHOCK ABSORBERS – Chassis shall be equipped with heavy-duty, double-action hydraulic or gas shock absorbers compatible with manufacturer's rated axle capacity at each wheel location (exception permitted, as appropriate, for rear air ride suspension). Shock absorbers shall be of sufficient length to allow for adequate travel in all situations without damage to the shock absorber or mount.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

SPRINGS – Chassis spring assemblies shall be of ample resiliency under all load conditions and shall conform in capacity to table shown herein.

Front springs are to be anchored at the front end and stationary eye to be protected by a wrapped leaf in addition to the main leaf.

Spring saddles shall be of suitable cast iron construction.

Rear Suspension (Air Ride) - All buses shall be equipped with rear air-ride suspension.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

STEERING – The steering gear shall be designed to assure safe and accurate performance of the vehicle under any and all conditions. Steering shall have full time power assist with an integral type steering gear (external hydraulic assist cylinder not acceptable). The mechanism must provide for easy adjustment for lost motion. The upper and lower kingpin bushings shall be constructed of bronze material. The steering column shall be equipped with tilt feature. Tie rod ends, drag links and kingpins shall be equipped with zerk type grease fittings unless permanently sealed.

No changes shall be made in the steering apparatus which are not approved by the chassis manufacturer.

There shall be a clearance of at least two inches between the steering wheel and cowl, instrument panel, windshield, or any other surface.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

TURNING RADIUS – A chassis with a wheelbase of 264 inches or less shall have a right and left turning radius of not more than 42 ½ feet, curb-to-curb measurement. A chassis with a wheelbase of 265 inches or more shall have a right and left turning radius of not more than 44 ½ feet, curb-to-curb measurement.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

TIRES – The chassis shall be equipped with six (6) "fully balanced tires", two on the front and four on the rear. Tires shall be of the tubeless type with full steel belted radial construction (sidewall and tread area). All tires shall be 11R22.5 in size and at least sixteen- (16) ply rating and load range H. Tires shall be equal in quality to the following named brand, but are not restricted to brands: (Goodyear G-159 or Michelin XZE)

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

WHEELS – The chassis shall be equipped with six (6) wheels and rims of the ten-stud hub piloted disc wheel design. All rims are to have a width of 8.25 inches. Each chassis to be equipped with a spare wheel/rim.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

TRANSMISSION – Chassis shall be equipped with an Allison 2500 series automatic transmission filled with Castrol TranSynd Fluid. Automatic transmission shall have an integral torque converter. Vehicle to be equipped with external transmission filter assembly. The transmission shifter shall be manufacturer's standard. Within the range selected, ratio changes shall be affected automatically at full engine power if desired and without use of an engine disconnect clutch. Transmission shift control shall have a position lock shift lever for each shift position. It shall have an illuminated range indicator embossed or made of metal and properly fastened.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

SERIAL NUMBER LABEL – Label shall be furnished showing the Vehicle Identification Number, G.V.W. R. and permanently affixed in a location and position for maximum visibility and legibility. Letters and numerals shall be cut or embossed.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

TOW HOOKS – Two heavy-duty tow hooks shall be furnished and factory installed, one on each frame rail at front in an approved manner and capable of towing the fully loaded vehicle.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

MINIMUM REQUIREMENTS FOR IDAHO TYPE-C SCHOOL BUS BODIES

DIMENSIONS

Body Sizes – The following standards shall govern the sizes of school bus Type-C bodies. The maximum overall outside width of the body shall be 102 inches. The height of the body from the top of the finished floor to the underside of the ceiling, at any point on longitudinal centerline from front vertical bow to rear vertical bow, shall be approximately 76-78 inches.

The following table shall govern the body lengths:

Maximum Seating Capacity	Approximate Body Length
41-42	244-268 inches
53-54	302-314 inches
65-66	358-376 inches
71-72	387-402 inches
77-78	402-410 inches

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Height, Length, Width, Weight Data Plate – A data plate including the actual bus height, actual bus length (maximum 45 feet, excluding accessories), actual bus width (maximum 102 inches, excluding accessories), and actual bus weight shall be included in the vehicle data plate in a location that is easily readable. Note: Actual weight means the actual weight of the completed bus full of fuel (60 gal.) and fluids, not the GVWR.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

BODY CONSTRUCTION

Design Specifications – Welds, rivets, or high strength bolts or a combination of these items in combination with adhesives may be used in connecting parts of the structural body. Bolts shall have a provision (self-locking nuts/lock-washers) to prevent loosening under vibratory loads. All bolts, nuts, washers and screws used throughout the body shall be cadmium or zinc plated, or thoroughly treated in a manner for prevention of rust.

Lock washer or locking devices shall be placed on all bolts used for structural purposes.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Materials – All construction materials must meet all current Federal and State construction standards.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

BODY FLOOR

Low Profile Heater – Low profile heaters are not allowed within the clear floor area required to accommodate a wheelchair.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Loads – The floor shall be designed to support all fixed and changeable loads. Fixed loads shall consist of all parts of the body supported by the floor system. Changeable loads are live loads determined on the basis of 125 pounds per passenger with three passengers per seat. The weights of the passengers and seats may be estimated at 70 pounds per square foot of floor area. To allow for vibration and shock, all loads shall be doubled.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Floor Plate – The floor of the body shall be 14-gauge Galvalume and/or zinc coated steel floor plate and shall be covered with a minimum of 5/8-inch, marine grade, 5-ply plywood. Plates shall run the full width of the floor and be supported at all edges. Openings should be made only when required such as at a wheel housing. All openings to be reinforced so as to maintain the full strength of non-punctured floor and not interfere with floor tracking on raised floor models. The floor plates shall be connected to supporting members so as to function as a part of the sills in carrying loads.

Access to the fuel sending unit shall be provided through a flush-mounted, screw-down plate that is secured and sealed.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Stepwell – A stepwell, having three steps, shall be built into the front assembly and completely enclosed with doors extending to bottom step. Each step shall be 14-gauge steel construction and covered with 3/16 ribbed rubber floor covering or other material equal in wear and abrasion resistance to top grade rubber. The metal back of the tread shall be permanently bonded to the step tread material.

Steps, including the floor line platform area, shall have a 1½ inch nosing that contrasts in color by at least 70 percent measured in accordance with the contrasting color

specification in 36 CFR, Part 1192 ADA, Accessibility Guidelines for Transportation Vehicles.

Step treads shall have the following characteristics:

1. Special compounding for good abrasion resistance and coefficient of friction of at least 0.6 for the step surface, and 0.8 for the step nosing.

2. Flexibility so that it can be bent around a ½" mandrel both at 130 degrees Fahrenheit and 20 degrees Fahrenheit without breaking, cracking, or crazing.

3. A durometer hardness 85 to 95.

The first step shall extend below skirt line to such depth as necessary to make the distance to the ground from the top surface of the step no less than 10 inches and no more than 14 inches.

On Chassis modifications which may result in increased ground clearance (such as four-wheel drive) an auxiliary step shall be provided to compensate for the increase in ground-to-first-step clearance. The auxiliary step is not required to be enclosed.

Step risers shall not exceed a height of 10 5/8 inches allowing for thickness of the plywood.

Steps shall not protrude beyond the side body-line. Exception allowed during loading or unloading of passengers.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Floor Covering – The floor under seat area, including wheel housings and driver's compartment, shall be covered with smooth finish rubber or equivalent covering, at least .125 inch thick. The aisle and entrance area shall be covered with wear resistant, ribbed pattern aisle-type rubber or equivalent a minimum overall thickness of .187 inch measured from tops of ribs. The adhesive for laminating the covering to the floor shall be a water-resistant type of trowel or spray consistency. All seams must be sealed with waterproof sealer. A rustproof molding strip shall be applied over all edges and joints of the covering.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

BODY FRAME

Framing – Where posts or bow frames are not loaded in a plane of symmetry, they shall be braced so as to deflect without twisting. The minimum depth of member shall be at least 1 and ½ inches and shall be 16-gauge or equivalent. The maximum spacing shall be 30 inches on center on all sections except one, which shall be no greater than 40 inches on center. If oversize section is used, there shall be installed additional roof reinforcement in that section.

The section modulus of the cross section shall be not less than 0.22 inches to the 3rd power.

A one-piece roof bow shall be located at each post to form a bow frame or bow frames. Roof bows shall not be buckled or distorted out of cross section during the process of bending to the curved shape. Each post shall be connected to a main floor sill, either directly through gussets or indirectly through the side rails. These connections shall consist of fasteners at a minimum of two elevations to effectively anchor the bow frame to the floor systems.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Roof Stringers – Two or more roof stringers or longitudinal members equal in strength to roof bows shall be provided to space the roof bows and reinforce the flattest portion of the roof skin. These stringers may be installed between the roof bows or applied externally. They shall extend from the windshield header and when combined with the rear emergency doorposts, are to function as longitudinal members extending from the windshield header to the rear floor body cross member. At all points of contact between stringers or longitudinal members and other structural material, attachment shall be made by means of welding, riveting or bolting. If stringers are applied internally, they shall be fastened to each roof bow so that the joint is equal in strength to the cross section of the weaker member. If stringers are applied externally, all joints must be lapped the full width of the roof bow and attached to each roof bow with four rivets or securely welded.

After the load, as called for in the static load test, has been removed, none of the following defects shall be evident:

1. Failure or separation at the joints where stringers are fastened to the roof bow.

2. Appreciable difference in deflection between adjacent stringers and roof bows.

3. Twisting, buckling or deformation of the stringer crosses section or fastening.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Side Stringer(s) – There shall be one or more side stringers or longitudinal members to connect the vertical structural members and to provide impact and penetration resistance in the event of contact with other vehicles or objects.

The side stringer shall be installed in the area between the bottom of the window and the bottom of the seat frame and shall extend completely around the bus body, except for door openings and body cowl panel.

The formed side stringer to be 16-gauge or equivalent metal, 3 inches wide before forming.

The side stringers are to be fastened to each vertical structural member, in any one or a combination of the following methods as long as stress continuity of the member is maintained:

1. Installed between the vertical members.

2. Behind the panels but attached to the vertical members.

3. Outside of the external panels.

The fastening method employed shall be such that the strength of the stringer is fully utilized.

The side stringer or longitudinal member may be combined with a rub rail, or be in the form of an additional rub rail, so long as the separate conditions and physical requirements for the longitudinal rub rails are met.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Front Framing – The design shall recognize the weakness at the windshield by provision of frame action to carry lateral loads. The front assembly shall be sufficiently heavy to withstand vibrations transmitted to it through chassis cowl.

Cowl posts shall be 12-gauge and attaching members shall be 14-gauge. There shall be a roof bow or reinforced header installed over these posts. Windshield or cowl posts must be of sturdy construction and so designed that the posts will not be so wide as to unnecessarily obstruct the driver's view. If cowl posts are made in two sections, the sections should be joined together by overlapping and welding in an approved manner or the sections should have an insert and be welded. The body shall be fastened to the chassis cowl in a waterproof manner.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Rear Framing – The emergency doorposts shall extend from the floor sill to the window header and shall be 14-gauge. There shall be installed on each side of the emergency doorposts an additional post equal in strength to the side posts, which shall extend from the floor sill to the windowsill.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Skirt Reinforcement – There shall be installed at the bottom of the outer paneling a continuous skirt stiffener, equal in strength to a 1-inch by 1/8-inch angle. *If body construction is of such a design that this type stiffener cannot be used, an additional 4th guardrail shall be applied externally.* Guardrails to be equal in strength and construction to the guardrails required in the Guardrail Section. This stiffener shall be supported by extending posts or bow-frames or by 16-gauge gussets.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

EXTERIOR PANELING

Design – Joints in roof panels should occur only at roof bows, roof stringers and window headers.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Sheet Metal Skin – All paneling above the top of the floor except the cowl panel, wheel housing, and body hoods shall be 20-gauge or heavier. The cowl panel shall be of 12-gauge or heavier metal, or cowl panel may be 14-gauge metal with 12-gauge framing.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Wheel Housing – The wheel housing shall be rigidly reinforced and shall be attached to the floor in such a manner as to prevent any water or dust from entering the body. They shall be designed for easy removal of tires and shall be 16-gauge or heavier.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

RUB RAILS – There shall be one rub rail located on each side of the bus approximately at seat cushion level which extends from the rear side of the entrance door completely around the bus body (except the emergency door or any maintenance access door) to the point of curvature near the outside cowl on the left side. There shall be one additional rub rail located on each side at, or no more than ten inches above the floor line. The rub rail shall cover the same longitudinal area as the upper rail, except at the wheel housings, and it shall, at a minimum, extend to radii of the right and left rear corners. Both rub rails shall be attached at each body post and all other upright structural members.

Each rub rail shall be four inches or more in width in their finished form, shall be constructed of 16-gauge steel or suitable material of equivalent strength and shall be constructed in corrugated or ribbed fashion. Both rub rails shall be applied outside the body or outside the body posts. Pressed-in or snap-on rub rails do not satisfy this requirement.

There shall be a rub rail or equivalent bracing located horizontally at the bottom edge of the body side skirts.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

BODY TEST

General – Throughout the construction of the body, there shall be evidence of good workmanship and engineering ability.

NOTE: Body shall meet all applicable FMVSS requirements. If requested, test information shall be furnished to the State for review.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

INTERIOR PANELS

Sheet Metal Lining – The roof section of the body is to be lined entirely with 20-gauge perforated sheet steel. Lining panels to have a minimum of at least 2 inches of unperforated steel for attaching to roof bows. Panels must be designed and fastened to minimize vibration and to be installed for easy removal. Panels from the windowsill to seat rail to be 22-gauge metal textured and embossed stainless, aluminized, or clear-coated galvanized steel sheet.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Moldings – At the junction of the interior paneling and the floor, there shall be installed a galvanized, aluminum or other corrosion resistant molding.

All interior lining shall be secured with sheet metal screws or rivets to meet FMVSS 221.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

SEATING

Description – Seats shall be forward facing and be spaced with the maximum knee room available within standard body lengths. All seats shall be 39” wide and 15 inches deep. Seats are to be arranged in rows of two or staggered with a minimum 12-inch center aisle.

Each seat leg shall be secured to the floor by a minimum of two bolts washers, and nuts. Flange-head nuts may be used in lieu of nuts and washers. All seat frames attached to the seat rail shall be fastened with two bolts, washers and nuts or flange-head nuts.

All material used in the seat cushions and backs shall meet the requirements of FMVSS 302. All seats shall meet the requirements of FMVSS 222.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Child Safety Restraint Systems (CSRS) – All School Buses shall be equipped with Integrated Child Restraint Seats that meet FMVSS 210, 213, 222. They shall also be designated for CSRS that meet FMVSS 225. All CSRS attachment hardware and anchorage systems must meet FMVSS 210, Seat Belt Anchorage or FMVSS 225, Tether Anchorage and Child Restraint Anchorage Systems. Seat upholstery material shall meet FMVSS 302 and shall match seat upholstery material used on all other seats. Any required decals must be placed on the exterior of the bus window and must be clearly visible from the inside of the bus.

CSRS compliant seats shall be installed. Specific locations shall be determined by purchasing school district according to the basic body design passenger rating prior to installation of CSRS seating:

41-42 Passenger Configuration	One Row (total of 2 seats)
53-54 Passenger Configuration	One Row (total of 2 seats)
65-66 Passenger Configuration	Two Rows (total of 4 seats)
71-72 Passenger Configuration	Two Rows (total of 4 seats)
77-78 Passenger Configuration	Three Rows (total of 6 seats)

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Belt Cutter – All buses shall be equipped with a seat belt cutting device secured in a location that is easily accessible to the driver while properly belted. The belt cutter shall be durable and designed to eliminate the possibility of the operator or others from being cut during use.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Seat Cushion Pad – The cushion pad is to be secured by a positive locking mechanism that requires the removal of a securing device before latch mechanism will allow seat cushion to be removed from frame.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Driver's Seat – The driver's seat shall be of a high-back type with a minimum seat back adjustment of fifteen (15) degrees, without requiring the use of tools, and a head restraint accommodating sizes through ninety-five (95) percentile adult male (as defined in FMVSS 208). The driver's seat positioning and range of adjustments shall be designed to accommodate comfortable actuation of the foot control pedals by 95% of the adult male/female population. The driver's seat shall have minimum distance between the steering wheel and the seat back of not less than eleven inches (11"), with a minimum aft adjustment of six inches (6"). The driver's seat shall provide for fore-and-aft and up and down adjustment and shall be contoured with adequate support on the sides. The seat shall be designed to provide lumbar support and positioned on the centerline of the steering wheel.

The driver's seat shall be secured with nuts, bolts and washers or flanged-head nuts.

NOTE: THE DRIVER'S SEAT SHALL BE EQUIPPED WITH A SEAT BELT RETAINER, ATTACHED TO THE RIGHT SIDE OF THE DRIVER'S SEAT, DESIGNED TO CAUSE THE SEAT BELT TO TRACK FORE AND AFT AS THE SEAT MOVES THROUGH ITS FULL EXTENSION.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Driver Seat Belt – A Type II lap belt/shoulder harness that meets the requirements of FMVSS 209 shall be installed. The belt shall have metal connections and the buckle shall be designed for push button release. The female connector shall be located on the driver's right and no higher than top of seat cushion. The male connector shall be on the driver's left. The lap/shoulder belt shall be guided or anchored to prevent the driver from sliding sideways under it. The belt assembly shall be equipped with an emergency locking retractor (ELR) for the shoulder belt and an automatic locking retractor (ALR)

for the lap belt or emergency locking retractor (ELR) with continuous belt system. The seat belt shall be anchored per FMVSS 210 and in such a manner that the fabric part of the belt will be protected from floor to seat level. The shoulder harness anchor point shall be adjustable, and meet the requirements of FMVSS 209 and 210. This adjustment shall accommodate drivers ranging in size from a (50) percentile adult female to the (95) percentile adult male.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

ASSIST RAIL AND CRASH BARRIER

Hand Rail – One safety assist handle or hand rail shall be provided on the passenger side of the front entrance securely mounted inside of body and should extend to bottom step to be within approximately 28 inches of ground. Handrail shall be made from 1 inch OD round stainless architectural tubing or 1 inch OD anodized aluminum.

The handrails shall assist passengers during entry or exit, and be designed to prevent entanglement, as evidenced by the passage of the NHTSA string and nut test, as defined in National School Transportation Specifications & Procedures School Bus Inspection.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Crash Barrier – All buses shall be equipped with crash barriers that meet FMVSS 222 & 302.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

ELECTRICAL SYSTEM

Wiring – All wiring shall conform to the standards of the Society of Automotive Engineers. Wiring shall be arranged in circuits as required, with each circuit protected by a fuse, circuit breaker or solid-state circuit protection. A system of color and number coding shall be used and an appropriate identifying diagram shall be provided to the end user, along with the wiring diagram provided by the chassis manufacturer. The wiring

diagrams shall be specific to the bus model supplied and shall include any changes to wiring made by the body manufacturer. Chassis wiring diagrams shall be supplied to the end user. All fuse/circuit breaker blocks shall have circuit identification decals.

The following body interconnecting circuits shall be color-coded as noted:

FUNCTION	**COLOR**
Left Rear Directional Lamp	Yellow
Right Rear Directional Lamp	Dark Green
Stop Lamps	Red
Back-up Lamps	Blue
Tail Lamps	Brown
Ground	White
Ignition Feed, Primary Feed	Black

The color of cables shall correspond to SAE J 1128.

Wiring shall be in at least six regular circuits as follows:

1. Head, tail, stop (brake) and instrument panel lamps

2. Clearance lamps and stepwell and exterior entrance door lamps that shall be actuated when the service door is open and headlights or clearance lamps are on

3. Dome lamps

4. Ignition and emergency door signal

5. Turn signal lamps

6. Alternately flashing signal lamps

Any of the above combination circuits may be subdidvided into additional independent circuits.

Heaters and defrosters shall be wired on an independent circuit.

The body wiring shall be enclosed with a removable cover extending from front to rear of body. All electrical connections between body and chassis should be made at the connection furnished on the chassis. Wires will not be spliced into existing chassis wiring.

Each body circuit shall be coded by number or letter on a diagram of circuits and shall be attached to the body in a readily accessible location.

The entire electrical system of the body shall be designed for the same voltage as the chassis on which the body is mounded.

All wiring shall have an amperage capacity exceeding the design load by at least 25 percent. All wiring splices are to be done at an accessible location and noted as splices on wiring diagram.

Vehicles equipped with multi-plex wiring system may be exempt from the requirements in this section.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Control Panel – To the left of the driver, there shall be installed an enclosed electrical accessory panel that can be easily removed for servicing. Inside the panel shall be located all relays, switches (including heater and defroster), junction block, circuit breakers, flasher units, and door buzzer. The accessory panel should be grounded to cowl of chassis by use of 10-gauge wire. All electrical connections inside panel to be constructed so as to eliminate heat buildup in wires. Control panel shall have heavy duty, rocker type or equivalent switches that are identified using international symbols. Accessory panel shall also be accessible through a door installed in the exterior of the bus.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Relays – There shall be provided two approved constant service, heavy-duty master relays which are to be actuated by the ignition switch and through which all electrical accessories except the turn signal units are to be wired. Wiring from the chassis to the relays and from the relays to the fuse block shall be number 10-gauge wire. One master relay to supply current for the dome lights, stepwell light, windshield wipers, emergency door buzzer and heater and defroster.

The other master relay to supply current for the flashing stoplights, stop arm lights, strobe lights and flashers.

A body wiring diagram of a size that can be easily read shall be furnished with each bus body or affixed in an area convenient to the electrical accessory control panel. Diagrams shall be specific to the bus being purchased.

The body power wire shall be attached to a special terminal on the chassis.

All wires passing through metal openings shall be protected by a grommet.

Wires not enclosed within the body shall be fastened securely at intervals of not more than 18 inches. All joints shall be soldered or joined by equally effective connectors, which shall be water-resistant and corrosion-resistant.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Dome Lights – Interior lights shall consist of one light in the driver area, six midship lights (three down each side) and one light in the rear of the passenger compartment with the rear light being rheostat controlled. Driver, midship and rear passenger lights are to be controlled by separate switches.

LIGHTING NOTE: ALL LIGHTING SYSTEMS SHALL MEET OR EXCEED ALL APPLICABLE FMVSS REQUIREMENTS.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Stepwell Light – Stepwell light shall be provided which adequately illuminate the aisle and stepwell. The stepwell light shall be illuminated by a service door-operated switch, to illuminate only when headlights or clearance lights are on and the service door is open.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Exterior Entrance Door Light – An additional exterior mounted light shall be mounted next to the service door to adequately illuminate the outside approach to the door, which shall activate simultaneously with stepwell light.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Body Instrument Panel Lights – Body instrument panel lights shall be controlled by an independent rheostat switch or integrated into the headlight switch.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Clearance/Marker Lights – Combination clearance/marker lights shall be installed per specifications. These lights shall have sealed electrical plugs and protective aluminum guards. Front lenses shall be yellow in color and rear lenses shall be red in color. On bodies over 30' in length an amber marker light is to be located midway on the bus body.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Eight Light Warning Systems LED (light emitting diode) – Each school bus shall be equipped with four (4) LED-flashing stoplights. The lens shall be red polycarbonate and designed to give illumination throughout 180 degrees. They shall also be clearly visible for a minimum of 500 feet. Lens shall be at least seven inches in diameter and the light assembly shall be of LED design. The circuit shall be wired so that one front, one rear, and stop arm light shall flash alternately with the other front, rear and stop arm light. The flasher shall be electronic (Weldon 7000 or equivalent) or an Electric Systems Controller (ELC) shall be used.

In addition to four red lamps described in the above section, four (4) 7 inch amber LED-lamps with polycarbonate lens shall be installed as follows: one amber lamp shall be located near each red signal lamp at same level, but closer to vertical centerline of bus. A system of red and amber signal lamps shall be wired so that amber lamps are energized manually, and red lamps, and stop arm are automatically energized (with amber lamps being automatically de-energized) when bus service door is opened. An amber pilot light and a red pilot light shall be installed adjacent to the driver controls or within the instrument cluster for the flashing signal lamp to indicate to the driver which lamp system is activated.

Air and electrically operated doors shall be equipped with an over-ride switch that will allow the red lamps to be energized without opening the door, when the alternately flashing signal lamp system is in it operational mode.

The area around the lenses of alternately flashing signal lamps extending outward from the edge of the lamps three inches (+/- ¼ inch) to the sides and top and minimum one inch to the bottom, shall be black in color on the body or roof area against which the signal lamp is seen (from a distance of 500 feet along axis of the vehicle).

Visors or hoods over the lights shall be provided and shall be black in color, with a minimum depth of four inches, according to National School Transportation Specifications & Procedures Placement of Reflective Markings. Visor or hood exclusions are permitted secondary to technological advances consistent with the 500 feet visibility requirement when tested in extreme direct sunlight conditions.

All flashers for alternately flashing red and amber signal lamps shall be enclosed in the body in a readily accessible location.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Flashing Stop Arm – Each school bus shall be equipped with an air or electric operated LED (light emitting diode) flashing stop signal. This signal shall be equipped with (2) flashing LED lights, at least 4 inches in diameter, red in color, and double faced or the letters spelling STOP in flashing red LED lights. The blade for the stop arm shall be metal in construction, octagonal in shape, shall be at least 18 inches in diameter, and shall be covered with Reflectorized Diamond Grade (ASTM TYPE 4) sheeting or equivalent. The word " STOP" shall be placed on both sides of the blade in letters 6 inches high.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Directional Turn Signals LED (light emitting diode) – Each school bus shall be equipped with amber front (fender mounted lights may be substituted if bus does not have appropriate cowl area) and rear surface mounted, directional turn signals that are at least seven inches in diameter or, if a shape other than round, a minimum of 38 square inches of illuminated area and shall meet SAE specifications. Rear directional turn signals shall be wired to hazard warning switch. Rear directional signal lamps are to be LED (light emitting diode type) and placed as wide apart as practical.

In addition to the rear directional turn signals, side directional lights shall be installed on the body to work in conjunction with the directional turn signals. One turn signal lamp on the left side shall be mounted rearward of the stop signal arm and one turn signal lamp

on the right side shall be mounted rearward of the service door. Both front side-mounted turn signal lamps shall be mounted forward of the bus center-line.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Stop/Tail Lights LED (light emitting diode) – All buses shall be equipped with four (4) combination stop/tail lights. Two combination lamps with a minimum diameter of seven inches, or if a shape other than round, a minimum 38 square inches of illuminated area shall be mounted on the rear of the bus just inside the turn signal lamps. Two combination lamps with a minimum diameter of four inches, or if a shape other than round, a minimum of 12 square inches of illuminated area, shall be placed on the rear of the body between the beltline and the floor line. The stop lamps, both 7 inch and 4 inch shall be activated by the service brakes and the tail lamps by the headlight switch. The rear license plate lamp may be combined with one lower tail lamp.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Back-Up Lights LED (light emitting diode) – Each school bus shall be equipped with two (2) white LED (light emitting diode), recessed, 4 inch or if a shape other than round a minimum of 13 square inches of illuminated area back-up lights meeting FMVSS No. 108. Backup lights shall be wired to the switch on transmission and be activated in reverse gear only. If backup lamps are placed on the same horizontal line as the brake lamps and turn signal lamps, they shall be to the inside.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Backup Warning Alarm – An automatic audible alarm shall be installed behind the rear axle and shall comply with the Society of Automotive Engineering Standard (SAE 994b) providing a minimum of 112 dBA. The alarm shall be activated when the transmission is placed in reverse gear only.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

HEATING AND VENTILATION

Heating System – Heater system shall consist of four (4) heaters, 1 front driver side, 1 front stepwell side, 1 left side center and 1 left side rear. One front heater shall include a windshield defroster that will direct a sufficient flow of heated air onto the windshield, the window to the left of the driver and the glass in the viewing area directly to the right of the driver to eliminate frost, fog and snow. Heaters shall have minimum total output of at least 285,000 BTU's per hour at a temperature differential of 150 degrees between the hot water and the ambient air temperature. Heaters and defroster systems shall conform to SAE J381, J382 and test procedure J2233 and be equipped with an auxiliary water circulation pump.

All heaters will be supplied with a replaceable filter. On buses equipped with elevated driver seat platform, and if the air intake for the heater faces the rear of the bus, there shall be a steel kick plate barrier to protect the filter from damage. The barrier shall be designed to allow sufficient air intake to the heater and be designed for easy removal.

A heavy duty, fresh air, heater shall be provided which uses the hot engine water as a heat source. The heat exchange shall be of the coil type and capable of withstanding an internal pressure of 300 psi. Along the windshield sill, there shall be installed a metal or plastic ducting having a capacity of not less than 150 cubic feet of air per minute. The duct shall have sufficient louvers or adjustable diffusers to direct a strong flow of properly heated air over the entire windshield surface. Both sides of the windshield will have provided an equal volume of airflow to each side.

All forced air heaters installed by body manufacturers shall bear a name plate that indicates the heater rating in accordance with SBMTC-001. The plate shall be affixed by the heater manufacturer and shall constitute certification that the heater performance is as shown on the plate. Low profile heaters are not allowed within the clear floor area required to accommodate a wheelchair.

Each hot water system installed by a body manufacturer shall include one shut-off valve in the pressure line and one shut-off valve in the return line with both valves at the engine in an accessible location. There shall be a water flow regulating valve installed in the pressure line for convenient operation by the driver while seated.

All fittings and installation shall be above the floor level of the body. Heater hose shall conform to SAE specifications 20R1 class D2. Brass, copper elbows or rigid plastic sleeves shall be used in the water hose when it is necessary to make a 90-degree or greater bend in the lines. Rustproof adapters shall be installed in water hose connections to the engine. There shall be installed in the water line, between the heater and the engine water pump, one all brass shutoff. Motors and fans shall be easily accessible and

serviceable. All heater cores (front & rear) shall have shutoff valves and bleeders located at heater core. Cutoff valves to be of the quarter-turn ball valve type.

NOTE: The bus body company shall replenish the cooling system and fill the body heater system with Fully Formulated, Non-Organic, Heavy Duty Coolant having a mix of (50%) water and (50%) coolant. Coolant type and additives shall meet all requirements of the respective engine manufacturer and radiator supplier.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

INSULATION – The space between the exterior and interior perforated roof panels shall be completely covered with a 1½ inch thick layer of fiberglass or mineral wool insulation. Insulation must be installed above the perforated roof panels in such a manner as to prevent any insulation from filtering through the perforations into the passenger compartment. The space from the bottom of the side windows to the floor level shall be completely covered with a 1½ inch thick layer of fiberglass or mineral wool insulation.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

EXITS

Entrance Door – The entrance door shall be located at the front of the bus and on the driver's right when properly seated in the driver's seat. The entrance door shall have a minimum horizontal opening of 24 inches and a minimum vertical opening of 68 inches. It shall be air or electrically operated and be of split, folding or jackknife type, under control of driver and so designed as to prevent accidental opening. If one section of a split-type door opens inward and the other opens outward, the front section shall open outward. An emergency release, switch or device to release the service door must be placed within easy reach of the driver and clearly labeled for identification and operation. When activated, it releases the entrance door mechanism so that it may be pushed open when the driver's door control device is in the closed position.

Vertical closing edges on split-type or folding-type entrance doors shall be equipped with flexible material to protect injury to fingers.

Lower, as well as upper, door panels shall be of approved safety glass. The bottom of each lower glass panel shall not be more than ten inches from the top surface of the

bottom step. The top of each upper glass panel shall not be more than three inches from the top of the door.

Service door shall be made of steel or aluminum. It shall be securely hinged with piano type hinges, two point steel pins, bronze bushing and/or bearing hinges or pivots. It shall be fastened to the adjoining member and shall be provided with suitable weather stripping top and bottom to prevent leaks. ***An exterior handle mounted on the outside of the entrance door is required to assist driver in opening the door from the outside.***

A suitable safety pad shall be installed on interior of door header.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

EMERGENCY EXITS

Emergency Door – An emergency door shall be located in the center of the rear of the body. It shall have a minimum horizontal clearance of 24 inches and a minimum vertical clearance of 48 inches. Door shall be hinged on the right side (when facing bus from rear) with an approved type of hinge meeting FMVSS 217 requirements. It shall open outward and shall be designed to open from both inside and outside of bus. Door shall be equipped with a metal or approved strap doorstop, which shall limit its opening to 120 degrees. Rear emergency door must be equipped with a hold open device, which complies with FMVSS 217. The words "EMERGENCY DOOR" or “EMERGENCY EXIT”, in letters at least 2” tall, shall be placed at the top of or directly above the emergency door or in the metal panel above the top glass, both inside and outside the bus.

The upper portion of the emergency door shall be equipped with approved safety glazing, the exposed area of which shall be at least 400 square inches. The lower portion of the rear emergency door shall be equipped with a minimum of 350 square inches of approved safety glazing.

The emergency door shall be equipped with interior padding at the top edge of the door opening. Padding shall be at least three inches wide and one inch thick, and shall extend the full width of the door opening.

Operation instructions shall be located at or near the emergency exit release handle, both inside and outside of the bus. Outside shall consist of a black arrow pointing in direction of handle travel.

Emergency Exit Alarm – The rear emergency door shall include an alarm system that includes an audible warning device (buzzer) at the emergency door exit and also in the driver’s compartment. The buzzer shall be activated to warn the driver when the

emergency door is not properly fastened.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Emergency Windows And Hatches – All buses shall be equipped with a total number of emergency exits as follows for the indicated capacities. Exits required by FMVSS217 may be included to comprise the total number of exits specified.

0 to 42 Passengers = 1 emergency exit window per side and 1 roof hatch.
43 to 78 Passengers = 2 emergency exit windows per side and 2 roof hatches.

All exits are to be evenly spaced through the passenger compartment of the bus to provide optimal passenger egress. Windows shall not be blocked by passenger seat backs.

The words "EMERGENCY EXIT" is to be lettered on interior and exterior of bus at top of windows. Instructions to operate emergency exit windows shall be located on the inside of the bus.

Emergency exit windows shall include an alarm system that includes an audible warning device (buzzer) in the driver's compartment. The buzzer shall be activated to warn the driver when an emergency exit is not properly fastened.

All emergency exits shall comply with all requirements of FMVSS 217 for emergency exits.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

WINDOWS AND WINDSHIELD

Side Windows – There shall be installed on each side of the body an adjustable split sash window between each framing post. Each window shall provide an unobstructed opening of at least nine inches but not more than 13 inches high and at least 22 inches wide, obtained by lowering the window. One window on each side of the bus may be less than 22 inches wide. A finger touch type opener shall control window opening.

Glass for window shall be set in an approved galvanized steel channel or extruded aluminum and shall furnish ample protection from weather and must be guaranteed

against leakage from rain. The first window behind the driver and first two windows on the passenger side shall be of thermo-pane design.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Driver's Window – There shall be installed to the left of the driver a window with a sliding ventilator sash easily operated from the driver's seat with an approved control. Adjoining the ventilator sash, there shall be a window, which will permit easy exit in case of emergency. Glass used in driver's window is to be installed in sash of the same quality as side windows and shall be of thermo-pane design.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Rear Windows – There shall be installed at the rear of the body on each side of the emergency door, a window set solid in a suitable and waterproof manner.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Entrance Door Windows – There shall be installed in each section of the entrance door one or two glasses of thermo-pane design. (See Entrance Door)

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Windshield – The windshield shall be of approved laminated glass construction and shall be set solid and installed in an approved waterproof manner. It shall provide a wide angle of vision, shall have a slight tint to prevent glare.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

GLASS

Quality – All glass used in the body shall be of the "Safety Glass" type conforming to requirements of the American Safety Code for Safety Glazing Materials. All glass should be legibly and permanently marked.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Windshield Glass – The glass in windshield shall be heat-absorbent, laminated plate. It shall have a horizontal gradient band starting slightly above the line of the driver's vision and gradually decreasing in light transmission to 20 percent or less at top of windshield.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Window and Door Glass – The glass used in the doors and windows shall be of AS-2 quality and meeting FMVSS 205.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

BATTERY CARRIER

Location and Type – The body shall have a battery carrier with a pull-out sliding tray located under the body floor. Carrier must be sealed against water and dirt and should have a drain shield over top of door. Inside of carrier should be primed and painted with asphalt, varnish or acid resistant paint. Battery is to be fastened to a pull-out roller bearing sliding tray for easy servicing and sliding tray is to be provided with locking device to securely hold it in place in the battery carrier. Battery box shall be approximately 14 inches high by 25 inches wide by 16 inches deep. Battery box shall be capable of accommodating two or three (2-3) BCI Group 31 (or equivalent) batteries with a total of no less than 1900 CCA.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

REAR BUMPER

Size – The rear bumper shall be of pressed steel channel at least 3/16 inch in thickness and 9½ inches wide (high). It shall be wrapped around the back corners of the bus and it is to extend forward a minimum of 12 inches, measured from the rear most point of the body at the floor line. It shall be flush mounted to body sides or protected with an end panel.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Attachment of Bumper – The bumper shall be attached to the chassis frame in such a manner as to be easily removed and be so braced as to develop the full strength of the bumper section. This is also to include rear or side impact and shall be so attached as to prevent hitching of rides. Rear bumper shall extend beyond the rear most part of the body surface at least one inch, measured at the floor line.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

ACCESSORIES

Interior Mirror – There shall be securely installed on the windshield header an adjustable rear view mirror so located as to give the driver a clear view of the entire interior of the bus and the road behind. Mirror to be distortion free laminated glass at least 10 inches by 30 inches in size, shall have a metal frame and metal back and be rubber or vinyl mounted. Plastic washers to be installed between mirror and mirror bracket to allow for mirror adjustment and minimize potential mirror damage during adjustment.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Exterior Mirror System – All buses purchased shall be equipped with a mirror system complying with 49 CFR part 471, FMVSS 111 as adopted by the National Highway Traffic Safety Administration.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Rear View Mirror System – Mrrors are to be installed for unobstructed viewing on all chassis. There shall be installed on each side distortion free glass mirrors. Mirrors shall be mounted on both the left and right side of the bus in an anodized or etched aluminum frame. Mirrors shall be of remote adjustment design so as to give the driver a clear view of the rear wheels of the bus and be mounted in accordance with FMVSS 111. The rear vision mirror system shall be capable of providing a view along the right and left sides of the vehicle which will provide the driver a view of the rear tires at ground level, and a minimum distance of 200 feet to the rear of the vehicle. Mirror system shall be heated, with remote controls and breakaway arms.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Crossover Mirror System – Bus shall be equipped with a crossover mirror system that meets or exceeds 49 CFR part 471, FMVSS 111 as adopted by the National Highway Traffic Safety Administration.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Windshield Wipers – The bus shall be equipped with a heavy-duty electric windshield wiper system. Wiper system shall be two- (2) speed with intermitting feature and of sufficient strength to operate a 14-inch blade on a 15-inch arm under all driving conditions. Minimum length of blade shall be 14 inches. Wiper arm shall be rust proof and installed as per FMVSS 107. Electric powered windshield washers shall be installed as per FMVSS 104.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Sun Visor – There shall be installed on the windshield header an interior adjustable transparent sun visor with a finished edge and not less than six inches by 30 inches. Visor is to be mounted in a position that is convenient for use by the driver.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

License Holder – One license holder shall be located on the left rear of the body.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Name Plate – There shall be installed on the inside of each body, a manufacturer's name plate which can be easily read, on which shall be shown the name of the manufacturer, the serial number of body, seating capacity, and date built. Plate to be metal or equivalent durable laminated decal.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

First Aid Kit – There shall be installed a removable metal, moisture-proof and dust-proof first aid kit sealed with a breakable type seal and mounted in the driver's compartment in a location that is physically accessible to all drivers and shall be mounted in such a way as to prevent the entanglement of clothing, backpack straps, drawstrings, etc. It shall be properly secured and identified as a first aid kit which shall contain, at a minimum, the following contents:

2 – 1 inch x 2 ½ yards adhesive tape rolls
24 – sterile gauze pads 3 inches x 3 inches
100 – ¾ inch x 3 inches adhesive bandages
8 – 2 inch bandage compress
10 – 3 inch bandage compress
2 – 2 inch x 6 feet sterile gauze roller bandages

2 – non-sterile triangular bandages approximately 39 inches x 35 inches x 54 inches with 2 safety pins
3 – sterile gauze pads 36 inches x 36 inches
3 – sterile eye pads
1 – rounded-end scissors
1 – mouth-to-mouth airway
1 – pair medical examination gloves

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Body Fluid Clean-Up Kit – There shall be installed a removable metal, moisture- proof and dust-proof body fluid clean-up kit sealed with a breakable type seal and mounted in the driver's compartment in a location that is physically accessible to all drivers and shall be mounted in such a way as to prevent the entanglement of clothing, backpack straps, drawstrings, etc. It shall be properly secured and identified as a body fluids kit which shall contain, at a minimum, the following contents:

1 – pair of medical examination gloves
1 - absorbent
1 - scoop
1 – scraper or hand broom
1 - disinfectant
2 – plastic bags with ties

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Fire Extinguisher – The bus shall be equipped with at least one rechargeable UL-approved pressurized, dry chemical fire extinguisher complete with hose. The extinguisher shall be mounted and secured in a bracket, located in the driver's compartment and readily accessible to the driver and passengers. A pressure gauge shall be mounted on the extinguisher and be easily read without moving the extinguisher from its mounted position. It shall have a total rating of 2A10BC or greater. Fire extinguisher shall be mounted in such a way as to prevent the entanglement of clothing, backpack straps, drawstrings, etc.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Overhead Storage Compartment – A compartment shall be located over the windshield header. Compartment is to have a hinged door (hold-open device required) and shall be equipped with boxed ends that protect the wiper motors from loose articles. These ends are to be easily removable for service to the wiper motors.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Warning Devices – Each school bus shall contain at least three reflective triangle road-warning devices that are enclosed in a storage box. These shall be mounted in an accessible place within the driver's compartment of the bus and shall be mounted in such a way as to prevent the entanglement of clothing, backpack straps, drawstrings, etc.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Windshield Steps – There shall be installed on each side of the body on the lower section of the cowl, a folding windshield step and a suitably located handle for easy cleaning of windshield. Handle may be either chrome-plated or painted chrome yellow or black.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Tow Hooks – Two tow hooks shall be attached to the rear of chassis frame and not allowed to project beyond the rear bumper. Installation shall be in accordance with the chassis manufacturer's specifications.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Fuel Filler Opening Cover – A suitable door of 20-gauge metal is to be installed over fuel filler opening on side of body.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Reflectors – There shall be installed on the bus body (4) amber and (4) red reflectors that meet FMVSS 108 requirements. The lenses are to be 3 inches in diameter and made from acrylic plastic with six reflecting angles. Frame (if used) is to be polished aluminum or zinc plated steel.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Driver's Fans – Two 12 volt electric fans shall be installed on the lower portion of the windshield header in a position capable of moving air to both sides of the windshield or towards the driver's seating position. They shall have separate switches with high, low and off positions. The fan shall have a metal housing, mounting bracket, fan guard, and blade.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

PA System – Each school bus shall be equipped with a PA system mounted in the driver compartment with internal speakers mounted mid-ship and in the rear of the passenger compartment only and an external speaker mounted under the engine hood or within the stepwell area in such a manner as to ensure protection from water damage.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Noise Suppression Switch – Each bus shall be equipped with a switch that will cut all power to radio, PA speakers and fans for noise suppression purposes and it shall be mounted within easy reach of the driver.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Passenger Advisory System – Each school shall be equipped with a passenger advisory system that activates the vehicle horn after a preset period of time. This system shall be activated when the driver places the ignition switch in the OFF position. This system shall require the driver to travel to the rear of the bus via interior aisle to deactivate. The control module is to be mounted in the driver area and have an adjustable activation delay. The horn is to sound until the driver deactivates the system with the deactivation switch mounted in the rear of the bus. Explicit instructions for operating this system shall be installed on the inside lid of the overhead storage compartment.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Splashguards – Each school bus shall be equipped with front and rear rubber splashguards. Installation shall be where the guards can prevent the most debris from being thrown under the bus body.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

MOUNTING

Chassis Preparation – In preparing the chassis frame for body mounting, rivet heads shall not be removed except on the extreme rear cross member and then only when necessary to move rear cross member to conform to body length. If tail pipe brackets must be removed due to body obstructions, they shall be replaced with new ones of equal strength as supplied by the chassis manufacturer.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Installation – The bid price shall include mounting the body upon the chassis. The body shall be securely attached to each chassis side rail. At the front and rear ends of the body on each chassis side rail there shall be installed a through bolt of not less than seven-sixteenth inch (7/16") in diameter. Bolts to be grade 5 with S.A.E. threads and lock washer. All attachments shall be made at main body sills. In addition to the above required tie downs, the following minimum number of approved type tie downs will be required: 41 passenger - 6; 53 passenger - 8; 66 passenger – 10; 78 passenger – 12. Bolts for these attachments shall be not less than 7/16 inch in diameter with S.A.E. threads and lock washers.

Rubber and fiber isolators, equal to or thicker than chassis rivet heads, shall be secured by a positive means to each body sill and installed at all points of contact between sills and chassis to prevent shifting, separation, or displacement of the isolators under severe operating conditions.

At any point where body sill sits on a rivet head, the rubber and fiber insert shall deform so that floor will be smooth.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

METAL TREATMENT AND PAINTING

Metal Treatment – All metal used in construction of bus body is to be mill applied zinc-coated, aluminum-coated, or treated by an equivalent process before bus is constructed. (Included are such items as structural members, inside and outside panels, floor panels and floor sills. Excluded are door handles, grab bar handles, stanchions, interior decorative parts, and other interior plated parts.)

All metal parts that are to be painted shall be, in addition to above requirements, chemically cleaned etched, zinc-phosphate coated, and zinc-chromate or epoxy-primed or conditioned by equivalent process. In providing for these requirements, particular attention shall be given to lapped surfaces, welded connections of structural members, cut edges, punched or drilled hold areas in sheet metal, closed or box sections, non-vented or non-drained areas, and surfaces subjected to abrasion during vehicle operation.

As evidence that above requirements have been met, samples of materials and sections used on construction of bus body shall not loose more than 10 percent of material by weight when subjected to a 1,000-hour salt spray test as provided for in the latest revision of ASTM Standard B-117.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Paint – All paint shall be unleaded. Paint shall meet National Standards for color and should have a finished gloss rating of at least 85 at 60 degrees. The paint shall be covered by a 5 year unlimited mileage warranty against all defects in materials and workmanship.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Exterior – The exterior of the complete bus body, including doors, shall be painted with two coats of National School Bus Yellow polyurethane as per Federal Standard No. 595a. The area around the lenses of overhead warning lights extending outward from the edge of the lamps three inches (+/- ¼ inch) to the sides and top and minimum one inch to the bottom, shall be black in color on the body or roof area against which the signal lamp is seen. Rear bumper, rub-rails and all other exterior trim shall be painted black.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Interior – The entire interior paneling of the bus, except the sections of aluminized steel and/or clear coated, shall be painted. One prime coat and two finish coats shall be required.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Floor and Structural Metal – The entire underside of the bus body, including floor sections, cross members, below floor line side panels, chassis metal fenders and all other exposed structural metals used in the body, shall be coated with rust-proofing material for which the material manufacturer has issued a notarized certification of compliance to the bus body builder that materials meet or exceed all performance and qualitative requirements of paragraph 3.4 of Federal Specification TT-C-520b, using modified test procedures* for the following requirements:

1. Salt spray resistance-pass test modified to 5 percent salt and 1000 hours.

2. Abrasion resistance-pass

3. Fire resistance-pass

*Test panels are to be prepared in accordance with paragraph 4.6.12 of TT-C-520b with modified procedure requiring that test be made on a 48-hour air-cured film at thickness recommended by compound manufacturer.

The undercoating material shall be applied with suitable airless or conventional spray equipment to the recommended film thickness and shall show no evidence of voids in the cured film.

Drive shaft sections along with any air brake control valves and brake lines which are color-coded shall **not** be undercoated.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

LETTERING

Type – Lettering and numbering shall conform to "Series B of Standard Alphabets for Highway Signs".

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Vinyl Lettering – The material should be a premium 2-mil high gloss cast vinyl for solvent resistance, fade resistant and withstand severe weather and handling conditions. The vinyl will have permanent acrylic adhesive with an adhesion factor of 4/lbs. per square inch and shall not lose its shape or adhesion due to extreme temperatures from -40 to 100+ degrees Fahrenheit. The backing paper sheet for the vinyl should be standard #78 lb. Kraft liner (or equivalent).

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Sides – Buses will be identified with black lettering (minimum four inches high) on both sides of the school bus using the purchasing district's name and number listed in the Idaho Educational Directory. They shall also be identified with its own number in two places on each side of the bus in the logo panel/belt line using six inch high black numbers. Numbers on the passenger side shall be as close to the first and last passenger windows as possible and on the driver's side as close to the stop arm and last passenger window as possible.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Front – On the front end cap as high as possible without impairment of its visibility shall be the words "SCHOOL BUS" in letters not less than 8 inches high. "SCHOOL BUS" to be on retro-reflective high intensity material.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

Rear – On the rear end cap as high as possible without impairment of its visibility "SCHOOL BUS" shall be in letters not less than 8 inches high. On or over the emergency door shall be the words "EMERGENCY DOOR" in letters 2 inches high. "SCHOOL BUS" to be on retro-reflective high intensity material.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

REFLECTIVE MATERIAL – All reflective material shall meet National School Transportation Specifications & Procedures (AKA National Standards) Placement of Reflective Markings requirements.

The rear of bus body shall be marked with strips of reflective NSBY material to outline the perimeter of the back of the bus using material which conforms to the requirements of FMVSS No. 131, Table 1. The perimeter marking of rear emergency exits per FMVSS No. 217 and/or the use of reflective "SCHOOL BUS" signs partially accomplish the objective of this requirement. To complete the perimeter marking of the back of the bus, strips of at least one ¾ inch reflective NSBY material shall be applied horizontally above

the rear windows and above the rear bumper, extending from the rear emergency exit perimeter, marking outward to the left and right rear corners of the bus. Vertical strips shall be applied at the corners connecting these horizontal strips.

"SCHOOL BUS" signs shall be marked with reflective NSBY material comprising background for lettering of the front and/or rear "SCHOOL BUS" signs.

Sides of bus body shall be marked with at least one ¾ inch reflective NSBY material, extending the length of the bus body and located (vertically) between the floor line and the beltline.

As specified ☐ **Exceeds specification** ☐ **Note exception** ☐

DELIVERY – "FOB Destination" within 180 days ARO (After Receipt of Order) is required. Delivery to any location within the applicable Area and within one-hundred-fifty (150) one-way highway miles of any of the following major Idaho cities is to be at no additional charge.

An additional five (5) dollars per mile (one-way miles, only) for any Area delivery to locations in excess of the one-hundred-fifty (150) miles requirement will be permitted. The additional five (5) dollar charge will apply only to excess miles.

Major Idaho Cities:

AREA A: Coeur d'Alene and Lewiston
AREA B: Boise and Twin Falls
AREA C: Pocatello and Idaho Falls

METHOD OF AWARD – Award will be "All-or-None" by AREA and Passenger Configuration (bus size) to the lowest responsive and responsible bidder based on Grand Total of extended unit prices bid. Bidder may offer a bid for any one or more of the Areas.

In order to include the bidders' prices for Additional Accessories in the bid evaluation the State Department of Education will add one-half the total price for each Additional Accessory to the bidder's price for each basic bus bid for purposes of bid evaluation and comparison prior to award.

Ordering Agencies reserve the right to choose to purchase none or any one or more of the Additional Accessories at time of order. The State does not guarantee that any minimum quantity of Additional Accessories will actually be ordered. Bidders MUST include a price for each of the Additional Accessories.

PUBLIC AGENCY CLAUSE – Contract prices shall be extended to other "Public Agencies" as defined in Section #67-2327 of the Idaho Code, which reads: "Public Agency" means any city or political subdivision of this state, including, but not limited to counties; school districts; highway districts; port authorities; instrumentalities of counties; cities or any political subdivision created under the laws of the State of Idaho. It will be the responsibility of the Public Agency to independently contract with the vendor and/or comply with any other applicable provisions of Idaho Code governing public contracts.

Question: Will you honor this Public Agency clause? YES___ or NO ___

Bidder is required to provide as a part of their bid response a copy of the Manufacturer's Standard Warranty for each bus bid (see Warranties, Page # 13, above).

BID SCHEDULE

Bidder (Company) Name	
Contact Name	
Telephone Number	
Facsimile	
E-Mail	

Orders Placed With	
Contact Name	
Telephone Number	
Facsimile	
E-Mail	

ESTIMATED QUANTITITES – Quantities given below are purchase estimates from previous year and are for bid evaluation purposes only and are not guarantees. Actual number of buses to be ordered and delivery locations are unknown and no minimum order quantities are guaranteed.

Passenger Configuration	41-42	53-54	65-66	71-72	77-78
AREA A					
AREA B					
AREA C					

BASIC BUS BID PRICES (exclusive of additional accessaries)

Passenger Configuration	AREA A	AREA B	AREA C
41-42	$	$	$
53-54	$	$	$
65-66	$	$	$
71-72	$	$	$
77-78	$	$	$

Bid Additional Accessories

ITEM	IDENTIFY ITEM (Must Meet SISBO where applicable)	COST (Indicate Increase (+) or Decrease (-) to Basic Bus Bid
2-Way Radio	Mfr.	$
Surveillance Camera	Mfr.	$
Student Crossing Gate	Mfr.	$
Additional Stop Arm	Mfr.	$
Wheelchair Lift	Mfr.	$
Wheelchair Tie Down (each)	Mfr.	$
Full Track Seating	Mfr.	$
Flat Floor with Full Track Seating	Mfr.	$
Air Conditioning	Mfr.	$
Automatic Tire Chains	Mfr.	$
Auxiliary Heater	BTU/Mfr.	$
Secondary Heated Steps	Mfr.	$
Rear Air Deflector	Mfr.	$
Driveline Retarder	Mfr.	$
Transmission Retarder	Mfr.	$
Tinted Passenger Windows	Mfr.	$
White Roof	Mfr.	$
Vandal Locks	Mfr.	$
Under Bus Storage	Cubic Feet	$
AM/FM Radio	Mfr.	$
Hydraulic Brakes In-lieu of Air Brakes	Mfr.	$
Rear Springs In-lieu of Air Suspension	Mfr.	$

(SEE AREAS MAP on next Page)